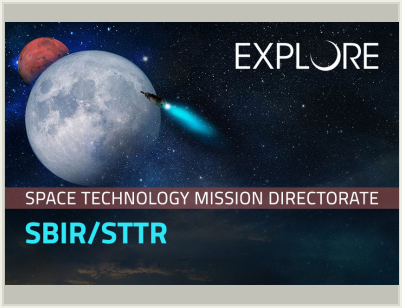
Software Infrastructure to Enable Modeling & Simulation as a Service (M&SaaS), Phase II

Completed Technology Project (2010 - 2012)

Project Introduction

This SBIR Phase 2 project will produce a software service infrastructure that enables most modeling and simulation (M&S) activities ⬌ from code development and compilation to runtime execution and collaboration ⬌ to be performed from a standard web browser across cloud- and grid-enabled computing resources. By addressing the security, scalability and virtualization challenges that have heretofore prevented service-centric M&S from being practical, this first-of-its-kind Modeling and Simulation as a Service (M&SaaS) platform will allow M&S users and developers alike to avoid many of the obstacles that currently confound the delivery, accessibility and usability of traditional, non-service-oriented M&S software. Building upon its commercial Grid Software as a Service (GSaaS) platform, Parabon convincingly demonstrated M&SaaS feasibility in Phase 1, as well as its ability to deliver the M&SaaS solution, completing in Phase 1 a Phase 2 solicitation goal of executing a NASA climate model across a computational grid and displaying the results, all from a browser. By the completion of Phase 2, M&SaaS will support, at TRL 6-7, browser-based source code editing, management of distributed repositories, research collaboration via forums and wikis, and virtualized build and runtime environments, all from within richly featured and access-controlled web accounts. M&SaaS has the potential to revolutionize how M&S is practiced across many industries ⬌ including defense, finance and pharmaceuticals ⬌ however, its benefit to NASA could be remarkable. Because the NASA mission often involves science that does not readily admit to direct experimentation, M&S is often the only means by which to answer significant scientific and engineering questions. The productivity improvements and cost reductions enabled via this new service paradigm will help NASA and other organizations generate discoveries more readily and realize significantly higher return on M&S investments.



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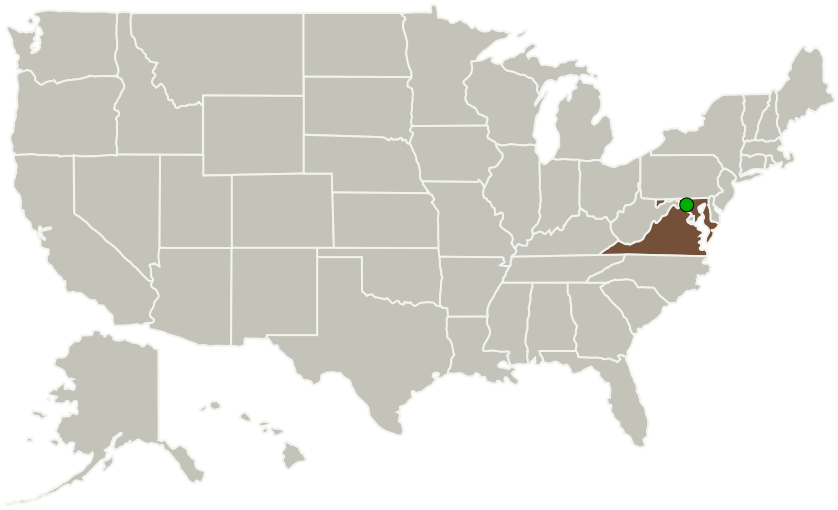
Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Parabon Computation, Inc.	Lead Organization	Industry	Reston, Virginia
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations	
Maryland	Virginia

Project Transitions

January 2010: Project Start

November 2012: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139470)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Parabon Computation, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

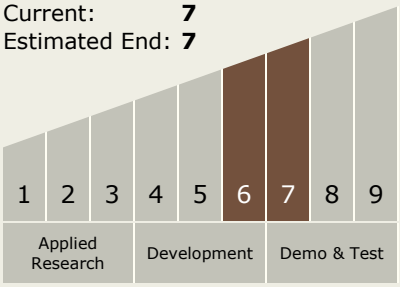
Carlos Torrez

Principal Investigator:

Steven L Armentrout

Technology Maturity (TRL)

Start: **6**
Current: **7**
Estimated End: **7**



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Technology Areas

Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
  - TX11.2 Modeling
    - TX11.2.2 Integrated Hardware and Software Modeling

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System